

**ANTICIPATED RESULTS:** Fifty percent of the CKD patients ( $n = 4$ ) were female; 63% ( $n = 5$ ) were white, and 37% ( $n = 3$ ) were black. On average, participants were aged  $56.6 \pm 13.8$  y with a BMI of  $31.7 \pm 9.4$  kg/m<sup>2</sup> and eGFR of  $40.7 \pm 7.9$  mL/min. Based on actual food intake, average Na intake on day 7 was  $2024 \pm 388$  mg. Average measured 24hUNa was  $2529 \pm 1334$  mg. The main ANOVA was significant ( $p = 0.02$ ). Results from the planned contrasts found that e24hUNa from the SALTED cohort, an equation developed specifically for CKD patients, was significantly higher than both Na intake ( $p < 0.001$ ) and measured 24hUNa ( $p = 0.007$ ). For the remaining 5 equations, e24hUNa was not significantly different from measured 24hUNa nor dietary Na intake. **DISCUSSION/SIGNIFICANCE OF IMPACT :** Our results suggest that e24hUNa calculated using most published equations may provide a reliable and low-burden method of assessing dietary Na intake in moderate CKD patients. These findings should be confirmed in larger samples. Additional studies are needed to validate or dispute the use of the SALTED equation for estimating Na intake.

## Commercialization/Entrepreneurship

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### An innovative rib construct for treatment of pediatric spinal deformity

Daniel Bonthius<sup>1</sup><sup>1</sup>Medical University of South Carolina

**OBJECTIVES/GOALS:** The rib construct is a novel device for treating childhood hyperkyphosis and kyphoscoliosis. The purpose of this study was to investigate the biomechanics, mechanism, and clinical outcomes of this device. The overarching hypothesis was that the rib construct is safe and effective for correcting hyperkyphotic spinal deformity. **METHODS/STUDY POPULATION:** **Biomechanical evaluation:** An *ex vivo* porcine spine biomechanical study compared traditional pedicle screw proximal fixation to the rib construct in terms of proximal fixation strength and construct stiffness. **Porcine model hyperkyphosis correction with rib construct:** An *in vivo* hyperkyphotic porcine model was used to study the ability of the rib construct to correct hyperkyphosis in the developing porcine spine. **Human hyperkyphotic correction with rib construct:** A retrospective study was conducted to examine the radiographic outcomes, complication rates, procedure times, and blood losses experienced by human patients that received rib construct surgery. **RESULTS/ANTICIPATED RESULTS:** **Biomechanical evaluation:** The rib construct was significantly less prone to proximal fixation failure and less stiff compared to pedicle screws. **Porcine model hyperkyphosis correction with rib construct:** The average T6-T14 thoracic kyphosis was  $35.8 \pm 3.2^\circ$  at the time of hyperkyphosis creation surgery. In response to corrective surgery with the rib-hook construct, T6-T14 thoracic hyperkyphosis decreased immediately post-op to  $11.3 \pm 7.8^\circ$  and continued to decrease to  $7.8 \pm 7.6^\circ$  until final follow-up 8 weeks post-op ( $n = 3$ ). **Human hyperkyphosis correction with rib construct:** Pre-op sagittal Cobb angle was  $81 \pm 31^\circ$  and fell to  $43 \pm 24^\circ$  post-op and to  $38 \pm 24^\circ$  at final follow-up; indicating ~100% correction (normal thoracic kyphosis is  $40^\circ$ ). **DISCUSSION/SIGNIFICANCE OF IMPACT:** The results suggest that the rib construct is a highly effective technique and superior to existing methods.

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### Translational Characterization of Blood Pressure Changes Following the DASH Diet- from Nutrition to Electrolytes to Exosomes

Dana Bielopolski, Bielo<sup>1</sup>, Andrea Ronning<sup>1</sup>, Dacia Vasquez<sup>1</sup>, Glenis George-Alexander<sup>1</sup>, Jeanne Walker<sup>1</sup>, Jonathan N. Tobin, PhD<sup>1</sup>, and Rhonda G Kost, MD<sup>1</sup><sup>1</sup>Rockefeller University

#### OBJECTIVES/GOALS:

1. analyze urinary protein exosome content pattern before and during DASH diet.
2. characterize urine electrolyte changes associated with changes in protein profiles, and hormonal changes before/after DASH diet.
3. analyze the association of these changes to the DASH-related BP response.

**METHODS/STUDY POPULATION:** In this proof of concept study, hypertension stage 1 volunteers will receive a DASH based menu during 14 consecutive days of elective admission to the RU research hospital. Participants will complete a food frequency questionnaire (VioScreen) with a bionutritionist. Throughout the intervention period, participants will be assessed for blood pressure, plasma renin and aldosterone, and 24 hour urines for electrolytes, creatinine, protein, albumin and first morning urine collected for exosomes. Exosome analysis will be performed by a commercial lab. Proteome analysis will be conducted in the RU Mass-spectrometry service. **RESULTS/ANTICIPATED RESULTS:** The causal pathway we will elucidate hypothesizes that: 1) changes in diet affect blood electrolytes, and through these, aldosterone. 2) Aldosterone alters the expression of specific transporter proteins in the renal tubule; protein expression will be reflected in the urine exosome. 3) These transporters affect the excretion of electrolytes, as reflected by urinary ratio of sodium (Na) to Potassium (K). During consumption of the Western diet, the Na/K ratio is approximately 2-2.5, whereas we expect the urinary sodium/potassium ratio to be  $< 1$ , when the participant is eating a DASH based diet. **DISCUSSION/SIGNIFICANCE OF IMPACT:** This assay provides a clinical tool to assess dietary adherence, and the project will provide insights into the mechanism whereby DASH reduces blood pressure.

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### Development of a Catheter Stabilization Device for Stent Placement Aid

Dylan B Crocker<sup>1</sup><sup>1</sup>Duke University

**OBJECTIVES/GOALS:** Precisely, the goal of the device is to initiate a friction force between the delivery system and the arterial vessel wall to both assure immediate stent deployment and prevent axial advancement of the stent-anchoring wire. **METHODS/STUDY POPULATION:** A prototype was constructed and its effectiveness of applying a friction force to a vessel wall was tested *ex vivo* using an LRX Plus Materials Testing Machine. Afterwards, the experimental performance of the device was compared to that of a finite element simulated model. **RESULTS/ANTICIPATED RESULTS:** The device demonstrated the ability to apply a friction force to the vessel wall to meet its objective. However, experimental values were consistently greater than those gathered from the simulation. Since the force prescribed by the device is minimal, future work includes increasing the